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Evaluation Of Hematological Parameters Of Early Osteoporosis In Patients With Celiac Disease In Wasit Governorate

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ABSTRACT:

The aim of this study was to evaluate some hematological parameters in early osteoporosis in patients with celiac disease (CD). in the past decades, the incidence of osteoporosis associated with celiac disease has increased at an alarming rate among the elderly and postmenopausal women. This disease affects the effectiveness of many hormones, vitamins, and nutrients in the body and is characterized by deterioration of bone mass and microarchitecture, including the risk of eventual fractures. The study was conducted in the gastrointestinal unit and the prosthetics unit of Al-Zahraa Teaching Hospital, and the immunology unit and joints unit of Al-Karama Teaching Hospital in Wasit Governorate. During the period from October 2024 to February 2025.This study aimed to examination of risk factors (height, weight, age, sex, inheritance of the disease in the family, medical history, symptoms of the disease, other diseases, treatment methods). For the purpose of studying the hematological parameters of osteoporosis in patients celiac disease and comparing those results. This study was done on (75) blood samples were collected from elderly men and women Iraqi, including (25) blood samples from the group of patients with osteoporosis associated with celiac disease. (13) blood samples from females, (12) blood samples from male, and (50) blood sample from the control group. These samples were divided into two age groups, with (55-65) years represents the first age group, and (65-75) years represents the second age group. Samples were collected based on the incidence of osteoporosis in patients with CD and type of treatment, as well as the diagnosis of all patients according to international standard by the physician. The results of our study regarding diagnostic of early osteoporosis with celiac disease showed a significant decrease in parameters (ESR, Hb ,PCV , Lymphocyte , Basophil , Eosinophil , Neutrophil) and a significant increase in (WBC , RBC , Monocyte)in affected individuals with a $p < 0.05$. A non-significant increase of gender- linked in (WBC , RBC ,ESR , PCV , Hb, Monocyte , Lymphocyte , Basophil , Eosinophil , Neutrophil) in infected people When $p \geq 0.05$. Conclusions: In blood early osteoporosis in patients with celiac diseases on blood parameters, values showed A significant decrease in parameters and a corresponding increase in other parameters compared to healthy people at the level of $p \geq 0.05$, which is clear evidence of the presence of infections and anemia.

Key Words: *Osteoporosis, Hematological, Celiac disease.*

1. INTRODUCTION:

Osteoporosis is one of the major health problems in the skeletal system, which is associated with changes in bone tissue and its strength in a way that will be prone to fracture . This disease is prevalent and can strike people of all nationalities with many older men and women (1) .

Celiac disease (CD) is an autoimmune disease in which, in susceptible subjects, the ingestion of gluten triggers an immune attack on the small bowel, as well as a serological response . Unlike other autoimmune diseases, the immunogenic antigens that trigger the immune response in CD have already been identified and highly characterized . As such, removing those antigens by enduring a gluten-free diet (GFD) is a known effective treatment for CD (2).

Studies, on the other hand, have found an increased prevalence of CD in people with low BMD . An appropriate estimation of CD prevalence is 2–3% in those individuals with low BMD, in comparison with about 1% in the general population (3).

Aim of the study is to study Evaluating the hematological parameters of early osteoporosis in patients with celiac disease (CD) and knowing the effect of on the average values of these parameters in both osteoporosis and celiac disease.

2. MATERIAL AND METHODS:

2.1 Study design:

The study was conducted in the Gastrointestinal unit the of Al- Zahraa Teaching Hospital and in coordination with the Osteoporosis clinic/Al kut reabilitatation center & Prosthetics and Unit Joints in Al-Karama Teaching Hospital in Wasit Governorate during period October 2024 to February 2025. And their ages ranged from (55-75) years old . This study included for(75) blood samples were collected from elderly men and women Iraqi, including (25) blood samples from the group of patients with osteoporosis associated with celiac disease. (13) blood samples from females, (12) blood samples from male, and (50) blood sample from the control group. These samples were divided into two age groups, with (55-65) years represents the first age group, and (65-75) years represents the second age group.

Samples were collected based on data recorded for all patients: height, weight, age, sex, other diseases, inheritance of the disease in the family, questions about medical history, symptoms of the disease and treatment methods. hematological parameters in the blood were measured (WBC , RBC , Hb , PCV , ESR , differential white blood cell count).

2.2 Blood Sampling:

7 ml of venous blood samples were withdrawn and 1 ml was placed in a tube containing Ethylene diamante tetra acetate for checking the complete blood count and 2 ml in a tube containing 3.8% trisodium citrate for checking the Erythrocyte Sedimentation Rate (ESR) and 1 ml on slide for reading under the microscope for checking the differential white blood cell count.

Hematological Parameters:

Determination Complete blood count and ESR ,differential white blood cell count : The complete blood count was measured by using the Mindray BC-30vet Analyzer device and the erythrocyte sedimentation rate using Westergren method and the differential white blood cell count analysis was read under a microscope.

Statistical Analysis: The statistical method used one way analysis of variance (ANOVA). The appropriate statistical method for testing hypotheses is F Statistics, accepting or rejecting the test hypothesis based on the probability value method associated with the F Statistics, based on the statistical significance level of 5% or 1%. A t-test was also used to compare two sets of readings for the same sample, where the effect of this factor or indicator can be inferred.

3. RESULTS AND DISCUSSION :

Table (1) : It shows a comparison between patients of early osteoporosis with celiac diseases and control group of blood parameters.

Parameter	Patients (n=25) Mean±SE	Control(n=50) Mean±SE	P-value	Significance level
WBC(10^3\mm$^{3)}$	7.20 ± 0.25	7.78 ± 0.25	0.1013	ns
RBC (10^6\mm^3)	4.95 ± 0.19	5.27 ± 0.07	0.1226	ns
Hb(g\dL)	12.32 ± 0.31	14.49 ± 0.30	0.0000	***
PCV %	38.016±1.117	43.104±0.753	0.00045	**
ESR (mm\h)	24.92 ± 3.59	5.82 ± 0.31	0.0000	***
Monocyte	0.05 ± 0.00	0.06 ± 0.00	0.2831	ns
Lymphocyte	0.23 ± 0.00	0.52 ± 0.01	0.0000	***
Basophil	0.02 ± 0.00	0.36 ± 0.01	0.0000	***
Eosinophil	0.07 ± 0.00	0.01 ± 0.00	0.0000	***
Neutrophil	0.621 ± 0.005	0.522± 0.010	0.0001	***

* Significant ($p < 0.05$) ** Significant ($p < 0.01$) *** Highly significant ($p < 0.001$), ns : Not statistically significant

Table (1)shows the distribution of values for blood parameters used in studying the early osteoporosis with celiac disease and comparing these results with the control.

According to the blood parameters, The statistical tests for early osteoporosis with celiac disease, the test value showed that (P. value) was less than the level of significance (0.05) in(ESR , PCV , Hb , Lymphocyte , Basophil , Eosinophil , Neutrophil), which means that there are significant differences between these values for patients and control groups. The test value also showed that (P. value) is greater than The level of significance is (0.05) in (WBC , RBC , Monocyte), which means that there are no significant differences between the patients and control groups.

Table (2) : shows effect of gender on blood parameters for early osteoporosis with celiac disease for both patients and control .

Parameter	Gender	Patients	Control	P-value
WBC(10^3\mm$^{3)}$	Male	6.826± 0.289	7.81 ± 0.25	0.36
	Female	7.546± 0.362	7.59 ± 0.35	0.71
P-value		0.287	0.647	
RBC (10^6\mm^3)	Male	5.230±0.200	5.43 ± 0.05	0.180
	Female	4.652± 0.321	4.94 ± 0.09	0.327
P-value		0.134	0.0001	
Hb(g\dL)	male	12.731± 0.413	15.652± 0.213	0.0001

	Female	11.875± 0.446	12.247 ± 0.419	0.556
P-value		0.171	0.0001	
PCV %	Male	41.285± 1.483	45.9 ± 0.634	0.0016
	Female	36.725± 1.916	37.8± 0.112	0.508
P-value		0.070	0.0001	
ESR (mm\h)	Male	19.38± 3.63	5.64±0.39	0.0001
	Female	30.92± 6.05	6.18± 0.49	0.0001
P-value		0.109	0.412	
M (Monocytes)	Male	0.047± 0.005	0.06 ± 0.001	0.0001
	Female	0.061 ± 0.006	0.06 ± 0.001	0.843
		0.089	0.101	
N (Neutrophils)	Males	0.613± 0.007	0.514 ± 0.012	0.0001
	Females	0.628± 0.009	0.537 ± 0.017	0.0001
P-value		0.214	0.293	
L (Lymphocytes)	Males	0.223± 0.007	0.36 ± 0.008	0.0001
	Females	0.229± 0.006	0.37 ± 0.010	0.0001
P-value		0.521	0.934	
B (Basophils)	Male	0.020±003	0.008±.0004	0.998
	Female	0.018±0.001	0.009±0.0004	0.998
P-value		0.572	0.123	
E (Eosinophils)	Male	0.0716±0.005	0.022 ± 0.001	0.0001
	Female	0.064±0.004	0.025±0.002	0.0001
P-value		0.252	0.17	

* Significant ($p < 0.05$) ,

** Significant ($p < 0.01$) ,

*** Highly significant ($p < 0.001$)

ns : Not statistically significant

Table(2) shows the distribution of values of used in studying the effect of gender on blood parameters for early osteoporosis with celiac disease for both patients and control .

According to the blood parameters, The statistical tests for early osteoporosis with celiac disease, the test value showed that (P. value) was greater than The level of significance is (0.05) in (WBC , RBC ,ESR , PCV , Hb, Monocyte , Lymphocyte , Basophil , Eosinophil , Neutrophil), which means that there are no significant differences between the patients and control groups.

4. DISCUSSION :

WBC , RBC , Hb , PCV , ESR

In this study, it was observed that there was a significant increase in the levels of (WBC , RBC) and a significant decrease in the levels of (ESR , Hb , PCV) in early osteoporosis with celiac disease. The reason for this is that due to mineral and bone disorders resulting from osteoporosis(4). It may also be due to inflammation of the intestines(5). Also , it may be a result of bone metabolism and blood formation that develop from immature cell mature cells(6). The significant decrease in (ESR , PCV , Hb) levels is due to reason for deficiency of inflammatory proteins, also, the it may be due to anemia caused by iron or vitamin deficiency(7).

Lymphocytes , Basophil , Eosinophil , Neutrophils , Monocytes

In early osteoporosis with celiac disease, a significant decrease in the levels (Lymphocytes , Basophil , Eosinophil , Neutrophils) was observed in this study, and a significant increase in the level of(Monocytes) compared to the control. The reason for this is attributed to result of the immune response to the presence of gluten in the intestine , also , with increased it may be a result of inflammation caused by celiac disease (8). The significant decrease in(Lymphocyte , Basophil , Eosinophil , Neutrophil) there are several reasons formay be caused by immune system disorders , leading to changes in the number of wbc (9) . Also , be caused by inflammation that affects nutrient absorption (10) .It may also , be caused by nutritional deficiencies , especially if an appropriate diet is not followed(11)

In addition to the effect of gender on blood parameters , we notice a significant increase that may be due to chronic inflammation or linked to an immune response , as well as poor calcium absorption(12) . This considered a double risk and may lead to bone mineralization(13) .

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